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Abstract

PROGRESS IN NEUTRON THEORY FOR THERMAL REACTORS

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A number of new theories and calculation methods for thermal neutron lattices are reported in this paper. Recent achievements in thermalization theory represent the main improvement in reactor physics : this work is described in a separate paper. But there are many other problems, and the target is eventually to obtain a better understanding of the overall neutron balance.

Among the topics the following ones are discussed :

- Calculation of the thermal utilization factor in a cell made up of a number of concentric media
- Relation between the migration area and the distribution in space and energy of the neutron absorptions (cut-off between fast and thermal leakage).
- Determination of the diffusion coefficients in a lattice containing cavities.
- Spectrum of slowing down neutrons and calculation of the resonance escape probability.
- Specific problems : applications of heterogeneous methods. Resolution of the transport equation in the double Pn code. Fine structure inside fuel bundles, etc.

In these various fields important refinements have been achieved and are already used in practical lattice calculations.

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